Table 5C-1. Comparison of Compliance with API Recommended Practice 1129Assurance of Hazardous Liquid Pipeline System Integrity, First Edition, 1996

Section	Topic	Issue/Details	Compliance	Comments
Section 1	*General*	This recommended practice is a basic guide and information resource for activities to assist in providing increased assurance of a pipeline system's integrity	n/a	
Section 2	*Design and Construction for Integrity Assurance*			
2.1	General	Assurance of pipeline integrity begins with design and construction practices	n/a	Background information
2.2	Codes	Assuring pipeline integrity involves using design and construction codes	n/a	Background information
2.3	Specifications	Development and utilization of specifications should be used to provide detailed requirements.	n/a	Background information
2.4	Pipeline Route Selection and Environmental Protection	Pipeline routing should be based on a formalized risk assessment/management technique	will meet	Being implemented in mitigation measures
2.5	Construction Contractor/Supplier Considerations	An evaluation should be carried out to assure quality and capability prior to the selection and engagement of contractors, suppliers, and other resources.	n/a	Design and construction issue
2.6	Inspection	Inspections are required to ensure pipeline systems are installed in accordance with certain requirements and procedures	n/a	Since the focus of this review is on operational procedures, a compliance check of construction inspections is beyond the scope of this effort.
2.7	Records and Documentation	A complete record of construction data should be maintained	n/a	Background information
	Girth welds and nondestructive test results		Meets	Welding Manual
	Amount, location, cover of each pipe size installed		Meets	As builts, OP-19.10 to -19.13
	Location of pipeline crossings		Meets	As builts, OP-19.10 to -19.14
	Locations of buried utility crossings		Meets	As builts, OP-19.10 to -19.15
	Locations of overhead crossings		Meets	As builts, OP-19.10 to -19.16
	Locations of valves and corrosion test stations		Meets	As builts, OP-19.10 to -19.17
	Pipe mill certificates		Meets	WPL 100-2, WPL 101-1

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	Land survey records		Meets	Business records
	Corrosion control facilities records		Meets	CP system reports
	Coating material records		Meets	Construction records
	Application information		Meets	Permit records
	Hydrostatic test results		Meets	Welding Manual, Scope, 3.4; MCOJT 3.02, O2-ENG-1010
	Welder qualification records		Meets	Welding 102
	Inspector qualifications		Meets	
	Construction drawings		Meets	Design and construction issue
Section 3	*System Monitoring and Control*			
3.1	General	The pipeline controller must be able to operate the pipeline system within acceptable limits during normal and abnormal conditions	n/a	Background information
3.2	Controls	Knowledge of valves, actuators, pressure control devices, communication systems, and SCADA systems is required for design of controls.		SCADA
3.3	Leak Detection	Pipeline companies use a number of procedures and methods to detect the movement of products in their pipelines		SCADA
3.3.1	Computational Pipeline Monitoring - SCADA system			SCADA
3.3.2	Station/Terminal Sensors			SCADA
3.3.3	Monitoring of Line Conditions by Pipeline Controllers	Pipeline monitoring and trending for operation and failure		SCADA
3.4	Training/Testing	Pipeline operators should establish training standards for design and operational safety.	Meets	OOJT, MCOJT
Section 4	*Corrosion Control*			
4.1	Corrosion Control Design of New Pipelines	Corrosion protection within one year of construction. DOT 49 CFR Part 195, NACE RP0169		OP-6.53 to -6.59, -15.1 to -15.6, NACE - OP-6.26, design and construction issue.
4.1.2	Monitoring	Test stations installed during construction. NACE RP 01 69 4.5.		OP-6.54, -19.5, NACE not addressed

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Section	Topic	Issue/Details	Compliance	Comments
4.1.4	Coating Systems	External coating required. NACE RP0169 5,6.3.1; DOT 49 CFR § 195.238. Internal corrosion control per NACE RP 01 75.		OP-6.53 to -6.59, -15.1 to -15.16, design and construction issue
4.2	Coatings and Linings		n/a	Background information
4.2.1	Coating Selection	Factors and concerns for coating selection	Meets	OP-6.55
4.2.2	Coating System Evaluations	Evaluations of the coating systems on all structures should be conducted periodically	Meets	OP-6.55
4.3	Routine External Corrosion Control		n/a	Background information
4.3.1	Monitoring:	CP levels must be monitored annually	n/a	Background information
	Power sources	During annual survey, tests should be performed on these components	Meets	OP-6.54, CBT Module #20
	Cased pipe		Meets	OP-6.57
	Isolation flanges			
	Pipe-to-soil potentials		Meets	MCOJT 2.03, OP-6.53 to –6.58, -19.6
	Additional Monitoring:	Periodic monitoring of condition should be conducted on these components	n/a	Background information
	Above ground piping		Meets	OP-6.58, MCOJT 2.14
	Valves		Meets	OP-19.7, MCOJT 2.05, O2-OPR-1035
	Meter stations			
	Tankage		Meets	OPOJT 6.21, O2-FAC-1009
4.3.2	Rectifier Inspection	Rectifiers inspected once every two months, six times a year	Meets	OP-6.54, CBT Module #20, OP-19.6
4.3.3	Other Inspections	Electrical inspection of all bare pipe without cathodic protection, Net Protective Current Criterion. Once every five years	Meets	MCOJT 2.14, OP-6.58, OP-19.6
	Leak record review	Per 49 CFR 195.416(d)	Meets	OP-6.26, OP-19.5
	Maintenance of cathodic protection system	Per NACE RP 0169 10	Meets	OP-6.26
	Monitor electrically-shorted cased pipe	Monitor per company procedures	Meets	OP-6.57
	Inspect unearthed buried pipe.	Inspection to include coating condition, metallic pipe surface condition if exposed and internal conditions if cut.	Meets	OP-6.58
	Out of tolerance corroded piping replaced or repaired or operating pressure reduced	Per 49 CFR 195.416.	Meets	MCOJT 2.11, CBT Module LQ 18, LQ33

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Section	Topic	Issue/Details	Compliance	Comments
	Measurement of pipe-to-soil potentials	Including continuous current, interrupted current, cell-to-cell potential.	Meets	OP-6.53, -6.54
4.3.4	Close interval Survey (CIS)	Test frequency based on sound engineering judgement.	Meets	OP-6.54
4.4	Routine Internal Corrosion Monitoring and Control methods	Weight loss coupons inspected twice per year with chemical inhibitor use, 49 CFR 195.418	Meets	OP-6.58
	Test methods	Internal corrosion monitoring methods include the following:	n/a	Background information
	Probes	Electrical, galvanic and/or hydrogen probes	n/a	Addressed by reference to NACE requirements and in contractor terms.
	Visual inspections		Meets	OP-6.58, OP-19.6
	Test spools		n/a	Explicit reference discussion not found. Design and construction issue.
	Ultrasonic wall thickness measurements		Will meet	Being addressed in mitigation measures.
	Ultrasonic, magnetic flux leakage internal inspections		Meets	Addressed in ILI contracts and being addressed in mitigation measures
	Radiography			Design and construction issue
	Water chemistry tests	Including iron concentration, manganese concentration, pH, bacterial levels, oxygen levels, CO2, H2S, Cl, SO4, and inhibitor residual		Explicit discussion of such tests not found in manuals reviewed.
Section 5	*Inspection and Review*			
5.1.1	Regulatory Requirements		n/a	Background information
	195.412	Inspection of ROW and crossings under navigable waters	Meets	OP-6.22 to -6.25, -6.48 to -6.52, -19.5; MCOJT 2.16
	195.414	Corrosion control	Meets	OP-6.51 to -6.57, -15.1 to -15.16
	195.416	External corrosion control	Meets	OP-6.51 to -6.57, -19.5
	195.418	Internal corrosion control	Meets	OP-6.58, -19.6
	195.42	Valve maintenance	Meets	OP-19.7, MCOJT 2.05
	195.428	Overpressure safety devices	Meets	OP-19.8, MC-5.8
	195.432	Breakout tanks	Meets	OP-19.9, OOJT 6.21
5.2	Risk Assessment		Meets	Has been practiced and incorporated into proposed mitigation measures and LIMS

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Section	Topic	Issue/Details	Compliance	Comments
5.2.1	Analysis	Includes elements of third party damage review, corrosion, operating errors, manufacturing defects, and design/construction flaws	Meets	Mitigation plans
5.2.1.1	Consequences	Includes public and personnel health and safety, environmental damage, and property and/or asset losses	Meets	Mitigation plans
5.2.2	Results	Identifying high risk areas		Not addressed
5.3	Hydrostatic Testing		n/a	Background information
5.3.1	General	Per 49 CFR 195 Subpart E	Meets	OP-6.42, MCOJT 3.02
5.3.2	Effectiveness	Operators should evaluate each pipeline segment and/or components with respect to potential defect behavior.	Meets	Mitigation plans
5.3.3	Hydrostatic Testing Programs	Formalized program should be developed	Meets	Mitigation plans
5.3.4	Implementation	Testing schedule should be developed	Meets	Mitigation plans
5.4	Internal Inspection		n/a	Background information
5.4.2	Anomaly Characterization	Assessment plan used to plan and prioritize pipe repair/replacement; coating repair, debris removal in bedding or backfill	Meets	Mitigation plan
5.4.3	Frequency of Inspection or Inspection Planning	Based on sound engineering judgement	Meets	Mitigation plan
5.4.3.1	Group failure issues	Include, pipeline age, cathodic protection levels, pipeline condition, coating condition and type, leak history, MIC, soil type, soil stress, and population densities	Meets	Mitigation plan
5.4.3.2	Consequence Issues	Include location and use of public buildings, environmental considerations, and products transported	Meets	Mitigation plan
5.4.4	In-line Inspection Capabilities		n/a	Background information
	External and internal metal loss	Magnetic flux leakage technology or ultrasonic pulse-echo technology		Not addressed
	Geometric anomalies including dents	Mechanical calipers or sonar		Not addressed
5.4.5	Limitations	Consider factors effecting the accommoda-tion of internal inspection devices	Meets	Pipeline has been pigged previously

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5.4.6	Operating Considerations	Consider potential alterations to normal pipeline operations	Meets	Operational Control Procedures Mitigation Plan – Management of Change
5.4.7	Correlation of In-line Inspection and Close Interval surveys	CIS and internal inspection for pipeline corrosion control		OP-6.53 to -6.58
5.5	Tank Integrity - Referenced API Standards		n/a	Background information
	API RP 651	Cathodic protection of Aboveground Petroleum Storage Tanks	Meets	Design and construction issue
	API RP 652	Lining of Aboveground Petroleum Storage Tank Bottoms	Meets	Design and construction issue
	API RP 653	Tank Inspection, Repair, Alteration, and Reconstruction	Meets	WPL 102 and WPL 104
	API Std 2510	Design and Construction of LPG Installations	n/a	Does not apply
	API Std 2610	Design, Construction, Operation, Maintenance and Inspection of Terminal and Tank Facilities	Meets	OP-9, Operators On-The Job Training Manual, Preventative maintenance Manual, Operations Control Procedures, Safety manual
5.6	Other Reviews and Analyses		n/a	Background information
5.6.1	Reviews		n/a	Background information
	49 CFR 195.402	Maintenance and operating manuals and emergency response	Meets	OP-19.2
	49 CFR 195.402	Training	Meets	OP-18.1
5.6.2	Audits	Regulatory and internal compliance audits	Meets	Mitigation plan
5.6.2.1	Documentation requirements	Up-to-date documentation, completed and maintained		Expected to be covered within mitigation plan
		System for filing and retrieval		Expected to be covered within mitigation plan
		Personnel training for proper use		Expected to be covered within mitigation plan
		Match documentation and practice		Expected to be covered within mitigation plan
		Timely corrective action on discovered deficiencies		Expected to be covered within mitigation plan

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5.6.2.2	Audit requirements	Process used to improve performance		Expected to be covered within mitigation plan
		Assess overall effectiveness of compliance processes		Expected to be covered within mitigation plan
		Constructive feedback at action level with follow-up to ensure corrective action is taken.		Expected to be covered within mitigation plan
		Combine other compliance audits e.g. EH&S to improve efficiency of audit process		Expected to be covered within mitigation plan
5.6.3	Failure Analysis	Metallurgical examination of pipe, flange, bolting, fitting, or weld deterioration or failure.	Meets	Conducted when needed. See report on 1998 Houston accident.
		Metallurgical/electrical examination of unexplained machinery failure	Meets	Expected to be “conducted when needed”
		Other laboratory analyses or examination of various failures	Meets	Expected to be addressed when needed